

Descriptions of Two New Species of *Longidorus* (Dorylaimida: Longidoridae) from Nagano, Japan

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Two new *Longidorus* species collected from the rhizosphere of forest trees in Nagano, Japan are described and illustrated. *L. laricis* n. sp. is characterized by the expanded and offset lip region, short and bluntly conoid tail, long odontostyle, and extremely posteriorly located guide ring. This new species resembles *L. litchii* XU & CHENG, 1992, *L. fangi* XU & CHENG, 1991 and *L. orongorongensis* YEATES, VAN ETTEGER & Hooper, 1992, but differs from *L. litchii* in having larger a-value, expanded and offset lip region, wider lip region of female, and shorter tail of the first-stage juvenile; from the other two species in having more posteriorly located guide ring, and shorter tail of female. *L. naganensis* n. sp. is characterized by the broadly rounded and slightly offset lip region, bluntly conoid to almost hemispherical tail, long odontostyle, and posteriorly located guide ring. This new species comes closest to *L. litchii*, but differs from it in having a longer tail, wider lip region, 'C' to spiral shaped body of female, and shorter tail of the first-stage juvenile. Juveniles of two new species are separated into three developmental stages based on the lengths of bodies, stylets, etc. *Jpn. J. Nematol.* 25 (1) 33-43 (1995).

Key words: *Longidorus*, taxonomy, forest soil, developmental stages.

HUNT(3) listed 95 species of the genus *Longidorus* of the world, including two species inquirendae. Three species of this genus have been recorded from Japan: i.e. *L. martini* MERNY, 1966 known as the vector of the mulberry ringspot virus(9), and two undescribed species once reported from Gunma by SHISHIDA(5). During a survey of plant parasitic nematodes in Japan, I found several species of this genus. Two of them from Nagano are described herein under the names of *L. laricis* n. sp. and *L. naganensis* n. sp.

MATERIALS AND METHODS

Specimens examined in this study were extracted from soil samples by a modified COBB's decanting and sieving method. They were killed and fixed by boiling double-strength FP 4: 1, and processed to glycerol by SEINHORST's rapid method(4) for optical microscope observation. For scanning electron microscope (SEM) observation, the living nematodes were transferred to a processing chamber modified by DE GRISSE(2), killed and fixed at 4°C by 4% glutaraldehyde solution buffered with 0.1 M sodium cacodylate (pH 7.2) in a step-wise manner at every 30 minutes until the concentration of glutaraldehyde reached to 2%(1), and successively kept at 4°C for 72 hours. After washing with the buffer, they were postfixed by 1% osmium tetroxide with the buffer plus 5.7% sucrose solution for 12 hours at 4°C. After that, these specimens were

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dehydrated through a series of ethanol from 30% to 100%, dried by a critical point dryer with liquid CO₂, sputter coated with 20 nm platinum-palladium, and observed and photographed on Hitachi S-2460N SEM operated at 10 kV.

Longidorus laricis n. sp.

(Fig. 1, Fig. 2 A-C)

MEASUREMENTS. *Female*. Holotype: L=5.87 mm; a=98; b=10.7; c=173; c'=0.83; V=47.1; odontostyle=173 μ m; odontophore=81 μ m; anterior end to guide ring=90.6 μ m; tail=33.9 μ m; anal body width=40.6 μ m. Measurements of paratype females, male and juveniles are shown in Table 1.

DESCRIPTION. *Females*. Body medium size, almost cylindrical, gradually tapering toward both ends, habitus varying from 'J' to open 'C' shaped, almost straight anteriorly and curvature being more pronounced in the posterior fourth when relaxed by gentle heat. Cuticle smooth by light microscope observation, composed of two layers; outer layer very thin throughout the body, inner layer slightly thickened near the cephalic region and more in tail region, with very fine radial striations on tail; cuticle 3.1 (2.7-3.6) μ m thick at mid-body, 4.0 (3.8-4.5) μ m near the lip region and 8.9 (7.1-10.2) μ m at tail tip. Lateral hypodermal chords occupying about one-third corresponding body width, but narrower in oesophageal region. Body pores generally indistinct, 10-12 lateral, 5-6 ventral and 2-5 dorsal pores in the oesophageal region. Lip region expanded and offset from body contour by depression, flattened anteriorly, its edges rounded. Amphid pouches broad, slightly bilobed at the base. Amphid aperture pore-like on the base of lateral lips. Sixteen papillae arranged in the typical dorylaimoid pattern, i.e., six labial papillae in inner circle, and ten labial and cephalic papillae in outer one (Fig. 2 C). Odontostyle long and thin, with simple base, odontophore about half of the odontostyle length and slightly enlarged at the base. Guide ring single, extremely posteriorly situated at 93.7 (84.1-100.5) μ m or 5.4 (5.0-5.8) times lip region width (at the outer circle of labial papillae) from the anterior end. Nerve ring located in the posterior half of odontophore, only one nerve ring observed. Hemizonid around the level of nerve ring or slightly posterior. "Mucro" resembling spear tip, 4 (3-5) μ m long, observed in slender part of oesophagus. Two ampullae present in body cavity of slender part of oesophagus. Oesophagus typical of the genus, anterior part more or less coiled, oesophageal bulb measuring 107 (99-114) μ m long and 25 (23-26) μ m wide; dorsal oesophageal gland nucleus and subventral gland nuclei located at 27% (22-31) and 52% (49-56) of oesophageal bulb, respectively. Cardia hemispherical.

Reproductive organ amphidelphic and reflexed once, anterior and posterior branches almost equally developed. Vulva transverse slit, slightly anterior to equatorial of the body. Vagina extending about half body diameter, cuticularized, its inner part surrounded by sphincter muscles. Ovaries reflexed; oviduct separated from uterus by a sphincter. No sperm observed in the uteri. Prerectum 426 (281-593) μ m long. Tail short and bluntly conoid, dorsally convex, with two caudal pores on each side.

Male. Anterior part of body similar to female. Body curved strongly in the region of supplements. Testes paired, opposed, outstretched. Sperms indicate uniform, rounded to oval-shaped, 3.5 (3.1-3.8) μ m. Spicules paired, large, arcuate, measuring 66.2 μ m along the median line. Lateral guiding pieces 18.3 μ m long. One adanal pair supplements preceded by a row of eight ventromedian supplements. Tail bluntly conoid, dorsally convex, with three caudal pores on each

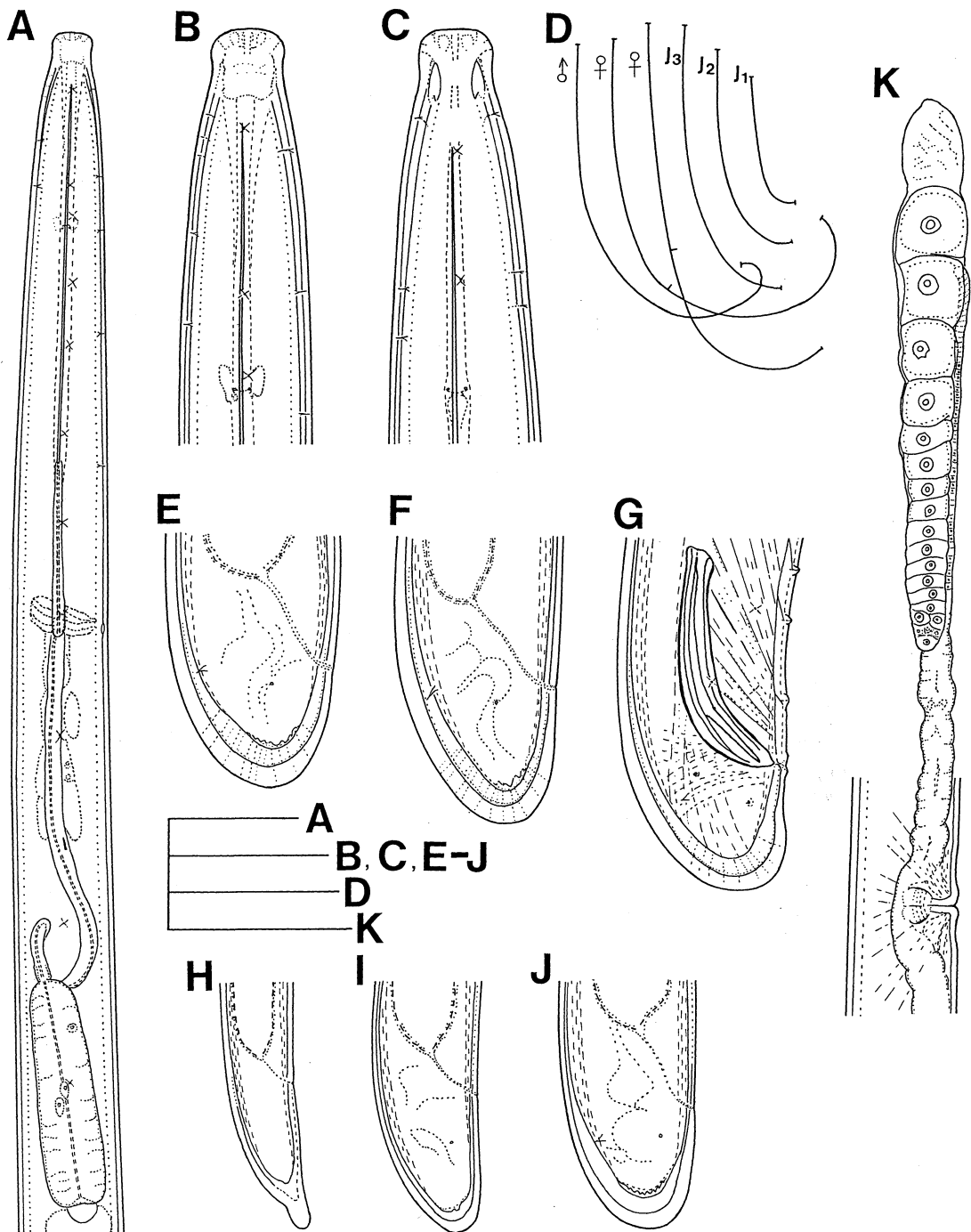


Fig. 1. *Longidorus laricis* n. sp. Female. A: Oesophageal region, B, C: Head region, D: Habitus, E, F: Tail, K: Vulva and anterior genital branch. Male. D: Habitus, G: Tail. Juveniles. D: Habitus, H-J: Tail of first, second and third stages. Scales: A=60 μ m; B, C, E-J=40 μ m; D=2 mm; K=100 μ m.

Table 1. Measurements of paratype females, male and juveniles of *Longidorus laricis* n. sp.

Stages	J ₁	J ₂	J ₃	Females	Male
n	40	30	15	24	1
L(mm)	1.51±0.11* (1.37–1.83)	2.36±0.25 (2.00–2.97)	3.54±0.27 (3.01–3.91)	5.27±0.40 (4.65–5.97)	5.05
a	66±2.7 (59–70)	70±3.3 (64–78)	83±4.4 (73–91)	95±7.1 (83–108)	100
b	4.5±0.67 (3.6–6.0)	5.4±0.68 (4.3–6.8)	7.1±0.74 (5.7–8.5)	9.2±1.21 (7.5–12.2)	8.0
c	41±2.6 (36–49)	70±6.3 (59–85)	110±7.2 (98–119)	179±16.6 (146–216)	150
c'	2.2±0.14 (1.8–2.4)	1.3±0.09 (1.1–1.5)	0.95±0.04 (0.87–1.0)	0.74±0.07 (0.64–0.90)	0.78
V	—	—	—	48.4±1.22 (45.8–51.2)	—
G ₁	—	—	—	7.6±1.17 (5.8–11.3)	—
G ₂	—	—	—	7.3±1.20 (5.6–11.7)	—
Odontostyle(μm)	105±2.7 (99–109)	113±2.9 (107–118)	142±4.7 (134–147)	171±6.6 (160–183)	178
Odontophore(μm)	51±2.2 (45–55)	67±4.2 (60–75)	79±1.6 (75–85)	88±5.9 (81–104)	84
Total stylet(μm)	156±3.4 (146–161)	180±5.5 (169–192)	221±6.0 (209–231)	259±9.4 (243–282)	261
Replacement odontostyle(μm)	112±2.8 (106–117)	138±6.8 (123–147)	168±5.7 (156–178)	—	—
Anterior end to guide ring(μm)	43.4±1.49 (41.0–49.3)	64.2±2.80 (59.1–68.6)	78.1±3.18 (74.9–82.9)	93.7±4.85 (84.1–100.5)	88.4
Tail(μm)	36.9±1.81 (31.5–40.4)	33.8±1.64 (29.9–35.7)	32.3±1.86 (29.4–35.1)	29.5±1.69 (26.0–33.1)	33.7
Lip region width(μm)	9.5±0.15 (9.4–10.0)	12.1±0.37 (11.5–12.9)	14.8±0.52 (13.3–15.3)	17.2±0.67 (15.7–18.2)	17.4
Body width at guide ring(μm)	17.8±0.37 (17.1–19.3)	24.2±0.84 (21.9–25.6)	29.7±1.22 (27.2–31.5)	35.6±1.18 (32.9–37.2)	35.7
Body width at oesophagus base(μm)	22.5±1.26 (20.5–26.6)	31.7±2.81 (27.8–37.4)	39.3±2.26 (34.7–42.0)	48.4±2.48 (41.6–52.0)	47.5
Body width at mid-body(μm)	22.9±1.68 (21.7–28.0)	33.6±3.99 (28.6–42.0)	43.0±3.56 (36.2–49.4)	55.5±3.78 (45.3–62.1)	50.6
A**	1.9±0.08 (1.8–2.1)	2.0±0.06 (1.9–2.1)	2.0±0.07 (1.8–2.1)	2.1±0.07 (1.9–2.2)	2.1
B***	4.7±0.23 (4.3–5.2)	5.2±0.24 (4.8–5.7)	5.2±0.26 (4.6–5.5)	5.4±0.25 (5.0–5.8)	5.1
Anal body width(μm)	16.9±1.15 (15.8–20.3)	25.8±2.05 (22.9–29.6)	34.1±1.61 (30.5–35.9)	39.8±2.26 (34.1–43.3)	43.4

*mean±standard deviation (range).

**Body width at guide ring/Lip region width.

***Anterior end to guide ring/Lip region width.

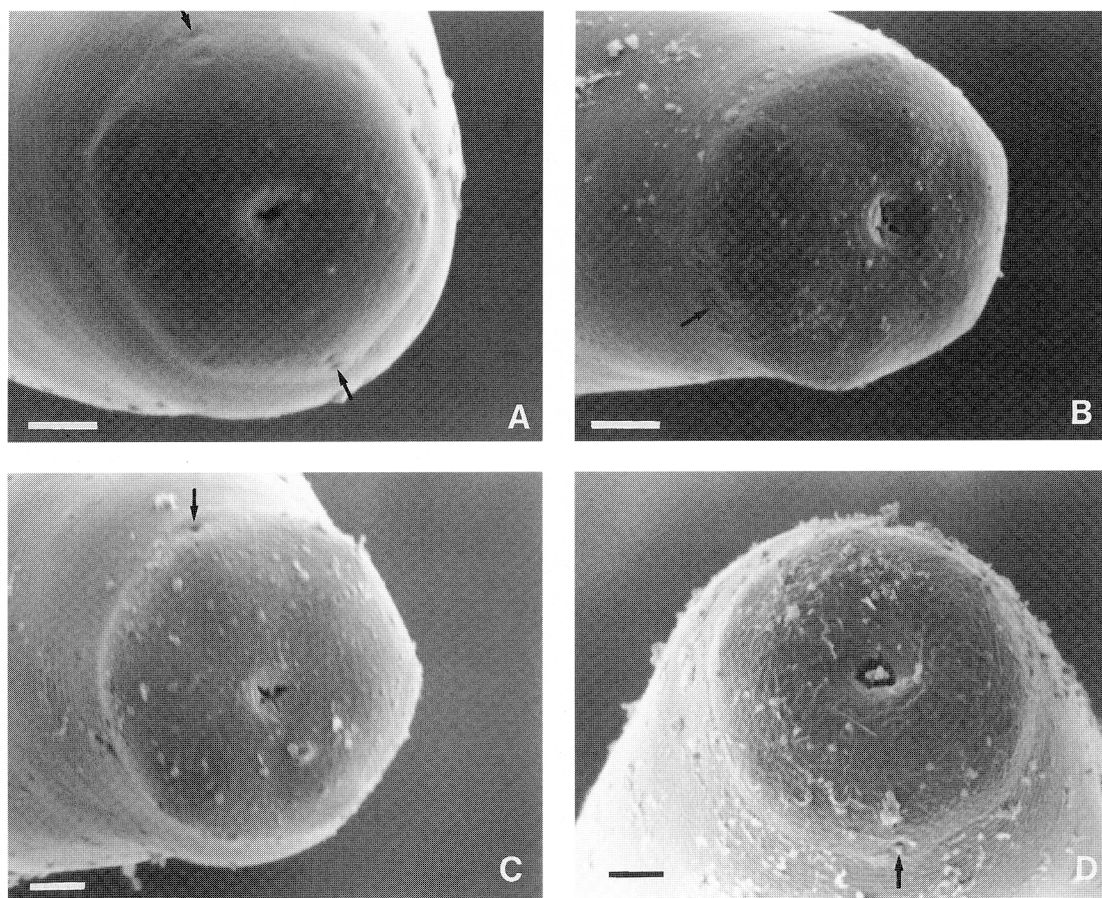


Fig. 2. SEM photographs of face views. A, B: *Longidorus laricis* n. sp. juveniles, C: *L. laricis* n. sp. female, D: *L. naganensis* n. sp. female. Arrows indicate amphid apertures. Scales: 2 μ m.

side.

Juveniles. Three developmental stages are recognized in juveniles. They are distinctly separated by differences in the lengths of bodies, total stylets, functional odontostyles and replacement odontostyles (Fig. 3). They are also separated by gaps of the following measurements; c-value, distance from anterior end to guide ring, lip region width, and body width at guide ring. Additionally, the first-stage juvenile can be distinguished from others by the following characters: the anterior part of replacement odontostyle situated in the wall of odontophore, tail elongate conoid with a digitate tip. The tails of the second and third-stage juveniles are rounded. Arrangements of the labial and cephalic papillae of juveniles are the same as those of female adults (Fig. 2 A, B). There is no significant difference between juveniles throughout the stages and females in the shape of the anterior region.

TYPE HABITAT AND LOCALITY. Specimens were collected from soil around roots of *Larix Kaempferi* (LAMB.) CARRIÈRE in Inagoyu (1,500 m alt.) in Koumi-machi, Minamisaku-gun, Nagano, Japan.

TYPE SPECIMENS. Holotype, collected by K. HIRATA on October 29, 1989, is deposited at the

Herbarium and Insect Museum of the National Institute of Agro-Environmental Sciences (NIAES), Tsukuba, Ibaraki, Japan. Paratypes of 18 females, one male and 85 juveniles are deposited at the NIAES. Two paratype females will be distributed to each of the following institutes: USDA Nematode Collection, Beltsville, Maryland, U.S.A. (USDANC); Rothamsted Experimental Station, Harpendon, Herts., England (RES); and Laboratoire des Vers, Muséum National d'Histoire Naturelle, Paris, France (MNHN).

DIAGNOSIS AND RELATIONSHIPS. *Longidorus laricis* n. sp. is characterized by the expanded and offset lip region, short and bluntly conoid tail, medium body size, long odontostyle, and extremely posteriorly located guide ring.

This new species resembles *L. fangi* XU & CHENG, 1991 (6), *L. litchii* XU & CHENG, 1992 (7) and *L. orongorongensis* YEATES, VAN ETTEGER & HOOPER, 1992 (10) in its long odontostyle and posterior position of guide ring. It differs from *L. fangi* in having longer odontostyle (171 (160–183) μm vs. 136 (124–144) μm), more posteriorly located guide ring (93.7 (84.1–100.5) μm vs. 78.9 (69.5–86.6) μm), bilobed amphidial pouches (not bilobed in *L. fangi*), shorter tail (29.5 (26.0–33.1) μm vs. 36.6 (29.3–46.4) μm) in female, and longer tail of the first-stage juvenile (36.9 (31.5–40.4) μm vs. 26.5 (24.4–30.0) μm); from *L. litchii* in having larger a-value (95 (83–108) vs. 78 (72–84)), expanded and offset lip region (slightly offset or continuous lip region in *L. litchii*), wider lip region (17.2 (15.7–18.2) μm vs. 13.5 (12.5–14.0) μm) in female, and shorter tail of the first-stage juvenile (36.9 (31.5–40.4) μm vs. 50.0 (44.5–57.0) μm); and from *L. orongorongensis* in having a narrower lip region width (17.2 (15.7–18.2) μm vs. 22.6 (22–23) μm), narrower body width at mid-body (55.5 (45.3–62.1) μm vs. 79.2 (72–87) μm), more posteriorly located guide ring (93.7 (84.1–100.5) μm vs. 67.8 (63–73) μm), shorter tail (29.5 (26.0–33.1) μm vs. 39 (37–44) μm), and shorter body (5.27 (4.65–5.97) mm vs. 7.24 (6.03–7.99) mm).

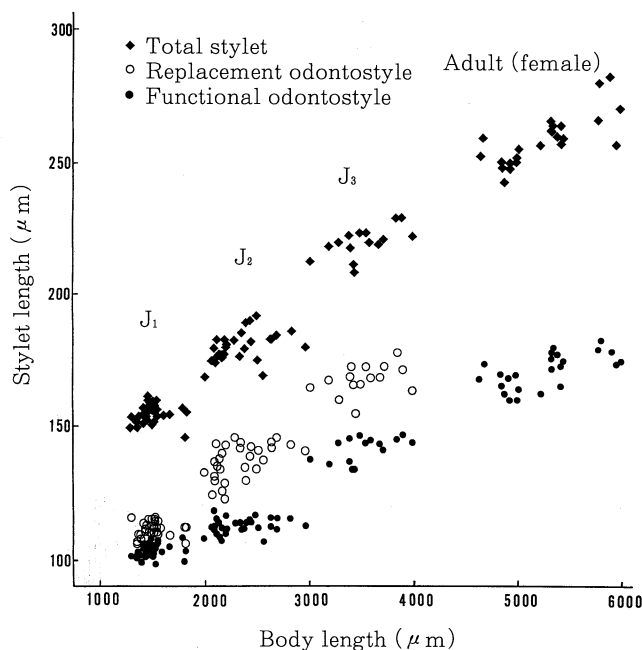


Fig. 3. Relationship between lengths of bodies and stylets of juveniles and females of *Longidorus laricis* n. sp.

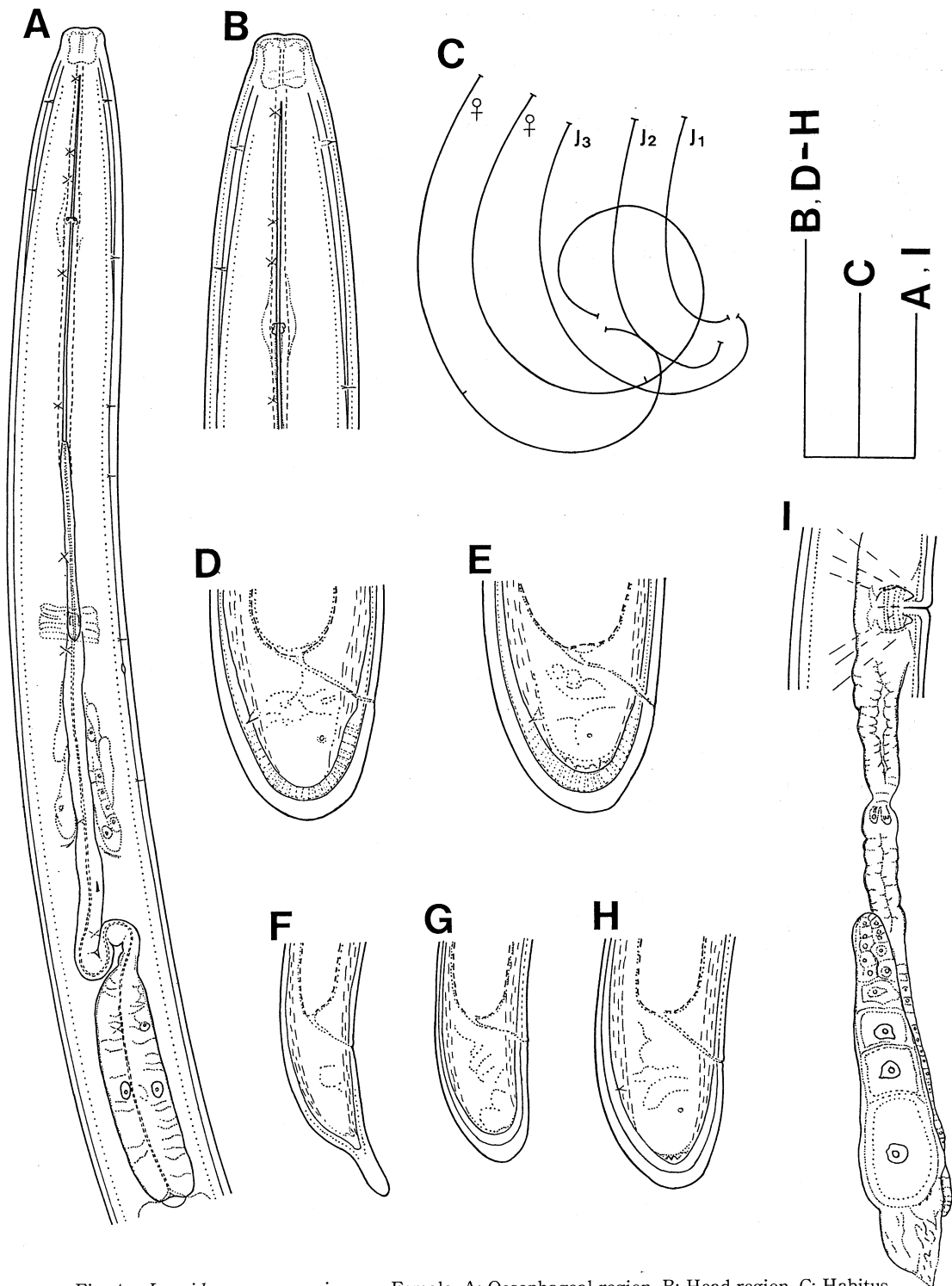


Fig. 4. *Longidorus naganensis* n. sp. Female. A: Oesophageal region, B: Head region, C: Habitus, D, E: Tail, I: Vulva and posterior genital branch. Juveniles. C: Habitus, F-H: Tail of first, second and third stages. Scales: A, B, D-I=60 μ m; C=1 mm.

Table 2. Measurements of paratype females and juveniles of *Longidorus naganensis* n. sp.

Stages	J ₁	J ₂	J ₃	Females
n	35	38	30	24
L(mm)	1.40±0.07* (1.31–1.56)	1.98±0.14 (1.72–2.27)	2.99±0.23 (2.53–3.47)	4.36±0.37 (3.83–5.18)
a	59±1.8 (55–63)	60±5.6 (55–67)	64±2.4 (60–72)	72±3.5 (66–78)
b	4.6±0.37 (3.8–5.3)	5.5±0.50 (4.5–6.8)	6.8±0.65 (5.7–8.4)	8.5±0.93 (6.7–9.8)
c	36±2.3 (32–43)	64±4.0 (56–75)	91±6.3 (77–102)	133±11.5 (117–164)
c'	2.2±0.14 (2.0–2.5)	1.2±0.07 (1.1–1.4)	0.92±0.05 (0.85–1.0)	0.77±0.06 (0.69–0.89)
V	—	—	—	51.0±1.80 (47.1–54.3)
G ₁	—	—	—	8.4±1.98 (6.2–15.1)
G ₂	—	—	—	8.3±2.53 (5.3–15.2)
Odontostyle(μm)	98±1.9 (94–101)	109±1.9 (104–112)	130±4.7 (114–136)	153±4.7 (141–160)
Odontophore(μm)	52±1.3 (46–57)	61±4.0 (53–70)	73±4.0 (63–81)	87±4.1 (78–94)
Total stylet(μm)	149±1.7 (143–156)	170±4.1 (163–177)	202±6.4 (184–213)	240±5.8 (231–250)
Replacement odontostyle(μm)	108±3.4 (101–116)	125±5.2 (114–136)	151±5.1 (138–160)	—
Anterior end to guide ring(μm)	41.5±1.03 (39.4–42.6)	53.7±2.39 (49.6–58.9)	66.9±1.63 (63.4–69.9)	81.9±3.04 (76.6–88.7)
Tail(μm)	38.9±2.25 (33.9–44.1)	31.2±2.69 (27.4–35.7)	32.9±2.52 (26.2–37.0)	33.0±2.80 (29.6–41.2)
Lip region width(μm)	8.6±0.16 (8.2–9.0)	10.6±0.50 (9.6–11.8)	13.3±0.61 (12.5–15.7)	16.6±0.57 (15.7–18.0)
Body width at guide ring(μm)	18.1±0.36 (17.4–18.8)	23.5±1.15 (21.9–26.2)	31.3±1.39 (27.6–33.9)	41.5±1.91 (38.6–46.7)
Body width at oesophagus base(μm)	23.6±0.87 (22.6–26.0)	31.5±2.20 (27.2–35.3)	43.6±2.59 (37.4–48.3)	55.6±3.44 (50.3–64.4)
Body width at mid-body(μm)	23.8±1.09 (22.6–27.7)	32.4±2.66 (27.2–37.8)	46.7±4.04 (38.0–56.7)	60.5±5.14 (53.6–72.9)
A**	2.1±0.06 (2.0–2.2)	2.2±0.08 (2.1–2.5)	2.4±0.07 (2.2–2.5)	2.5±0.10 (2.3–2.7)
B***	4.8±0.14 (4.5–5.1)	5.1±0.28 (4.4–5.6)	5.0±0.21 (4.3–5.3)	4.9±0.17 (4.7–5.3)
Anal body width(μm)	17.5±0.72 (16.4–19.3)	25.7±1.89 (22.7–29.7)	35.9±2.40 (30.9–41.4)	43.2±2.90 (38.6–49.8)

*mean±standard deviation (range).

**Body width at guide ring/Lip region width.

***Anterior end to guide ring/Lip region width.

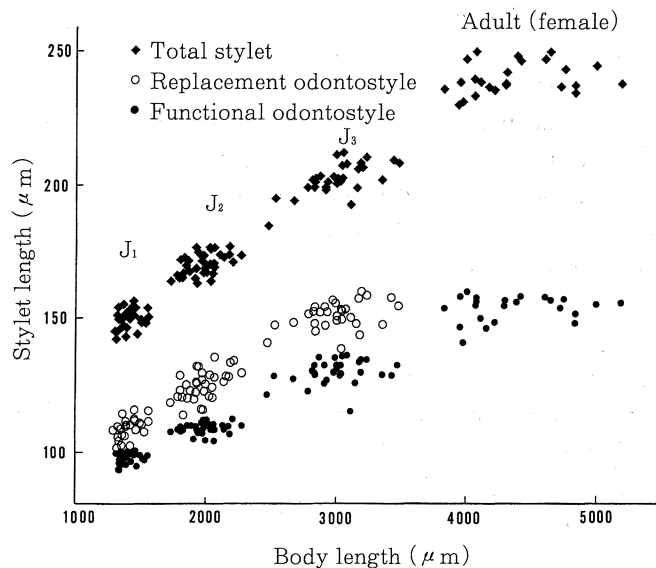


Fig. 5. Relationship between lengths of bodies and stylets of juveniles and females of *Longidorus naganensis* n. sp.

Longidorus naganensis n. sp.

(Fig. 2 D, Fig. 4)

MEASUREMENTS. *Female*. Holotype: L=4.09 mm; a=75; b=8.1; c=117; c'=0.80; V=48.0; odontostyle=154 μ m; odontophore=83 μ m; anterior end to guide ring=78.6 μ m; tail=34.9 μ m; anal body width=43.3 μ m. Measurements of paratype females and juveniles are shown in Table 2.

DESCRIPTION. *Females*. Body medium size, stout and cylindrical, assuming 'C' to spiral shape when relaxed by gentle heat, with most of curvature in the posterior half. Cuticle smooth by light microscope observation, composed of two layers; outer layer very thin throughout the body, inner layer slightly thickened near the cephalic region and more in tail region, with very fine radial striations on tail; cuticle 3.4 (3.0-3.9) μ m thick at mid-body, 5.7 (4.9-6.5) μ m near the lip region and 10.5 (8.9-11.9) μ m at tail tip. Lateral hypodermal chords occupying about one-third corresponding body width, but narrower in the oesophageal region. Body pores generally indistinct, 10-11 lateral, 2-7 ventral and 1-3 dorsal pores in the oesophageal region. Lip region broadly rounded, slightly offset from body contour by shallow depression. Amphid pouches broad, slightly bilobed at the base. Amphid aperture pore-like on the base of lateral lips. Sixteen papillae arranged in the typical dorylaimoid pattern, i.e., six labial papillae in inner circle, and ten labial and cephalic papillae in outer one (Fig. 2 D). Odontostyle long and thin, with simple base, odontophore slightly enlarged at the base. Guide ring single, located at 81.9 (76.6-88.7) μ m or 4.9 (4.7-5.3) times lip region width (at the outer circle of labial papillae) from the anterior end. Nerve ring located at the level of odontophore base, only one nerve ring observed. Hemizonid slightly posterior to nerve ring. "Mucro" resembling spear tip, 4 (3-6) μ m long, observed in slender part of the oesophagus. Two ampullae present in body cavity of slender part of oesophagus. Oesophagus typical of the genus, anterior part more or less coiled, oesophageal bulb

measuring 98 (89–110) μm long and 25 (24–28) μm wide; dorsal oesophageal gland nucleus and subventral gland nuclei located at 28% (25–31) and 50% (45–56) of the oesophageal bulb, respectively. Cardia hemispherical.

Reproductive organ amphidelphic and reflexed once, anterior and posterior branches almost equally developed. Vulva transverse slit, about the equatorial of body. Vagina extending about half body diameter, its inner part surrounded by sphincter muscles. Ovaries reflexed; oviduct separated from uterus by a sphincter. Tail bluntly conoid to almost hemispherical, dorsally convex, with two caudal pores on each side.

Male. Not found.

Juveniles. Three juvenile stages are distinctly separated by differences in the lengths of the bodies, total stylets, functional odontostyles and replacement odontostyles (Fig. 5). They are also separated by gaps of the following measurements; c-value, distance from anterior end to guide ring, body width at guide ring, and body width at oesophagus base. The tail of the first-stage juvenile is elongate conoid with a long digitate tip. Those of the second and third-stage juveniles are rounded without digitate tips. Anterior region of all juvenile stages are similar to those of female adults.

TYPE HABITAT AND LOCALITY. Specimens were collected from soil around roots of *Fagus crenata* BLUME in Toomi Ridge (1,000 m alt.), Hakuba-mura, Kitaazumi-gun, Nagano, Japan.

TYPE SPECIMENS. Holotype, collected by K. HIRATA on August 23, 1989, is deposited at the NIAES. Paratypes of 18 females and 103 juveniles are deposited at the NIAES. Two paratype females will be distributed to each of the USDANC, RES and MNHNP.

DIAGNOSIS AND RELATIONSHIPS. *Longidorus naganensis* n. sp. is characterized by the broadly rounded and slightly offset lip region, bluntly conoid to almost hemispherical tail, medium body size, long odontostyle, and posteriorly located guide ring.

This new species comes closest to *L. litchii* XU & CHENG, 1992 (7), from which it can be differentiated by the longer tail (33.0 (29.6–41.2) μm vs. 28.0 (25.5–32.0) μm), anterior position of guide ring (81.9 (76.6–88.7) μm vs. 90.0 (82.5–96.5) μm), wider lip region (16.6 (15.7–18.0) μm vs. 13.5 (12.5–14.0) μm), 'C' to spiral shaped body (open 'C' shaped in *L. litchii*) in female, and shorter tail of the first-stage juvenile (38.9 (33.9–44.1) μm vs. 50.0 (44.5–57.0) μm). It is also similar to *L. fangi* XU & CHENG, 1991 (6) and *L. laricis*, but differs from the former in having smaller a-value (72 (66–78) vs. 90 (81–98)), longer odontostyle (153 (141–160) μm vs. 136 (124–144) μm), wider body width at guide ring (41.5 (38.6–46.7) μm vs. 34.8 (32.9–36.6) μm), bilobed amphidial pouches (not bilobed in *L. fangi*) in female, and longer tail in the first-stage juvenile (38.9 (33.9–44.1) μm vs. 26.5 (24.4–30.0) μm); from the latter by smaller a-value (72 (66–78) vs. 95 (83–108)), smaller odontostyle (153 (141–160) μm vs. 171 (160–183) μm), shorter guide ring (81.9 (76.6–88.7) μm vs. 93.7 (84.1–100.5) μm), wider body width at guide ring (41.5 (38.6–46.7) μm vs. 35.6 (32.9–37.2) μm), and slightly offset lip region (offset lip region in *L. laricis* in females).

Longidorus species are reported to have four juvenile stages (3), however, two new species described in this paper have only three juvenile stages as *L. martini* in Japan (8) does.

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和文摘要

日本産ナガハリセンチュウ属の2新種の記載

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長野県の森林土壌から検出したナガハリセンチュウ属の2新種を記載した。*Longidorus laricis* n. sp. は、唇部にくびれがあり、尾は短い鈍円錐形、歯針が長く、頭端から導環までの距離が大変長い等の特徴を有する。本種は *L. litchii* XU & CHENG, 1992、*L. fangi* XU & CHENG, 1991及び*L. orongorongensis* YEATES, VAN ETTEGER & HOOPER, 1992に似ているが、*L. litchii*とは、a値が大きく、唇部にはくびれがあり、唇部体幅が広く、第1期幼虫の尾が短いことから、また*L. fangi*及び*L. orongorongensis*とは、頭端から導環までの距離が長く、尾が短いことから、それぞれ区別される。*L. naganensis* n. sp. は、唇部が僅かにくびれ、尾は鈍円錐からほぼ半円形、歯針及び頭端から導環までの距離が長い等の特徴を有する。本種は *L. litchii*に近似するが、*L. litchii*とは、尾が長く、唇部体幅が広く、第1期幼虫の尾が短いこと、熱殺後の体形がC字状から螺旋状であることから区別される。2新種の幼虫の齢期は、体長、歯針長、替歯針長等からそれぞれ3齢期に分けられた。